International Journal of Theoretical Physics

Volume 31, Number 1 January 1992

CONTENTS

Important Announcement 1

Additivity of Vector Gleason Measures 3
Jan Hamhalter

New Formulation of Quantum Mechanics 15
Stanley Gudder

Gauge Invariance of the Euler–Lagrange Expressions 31
Ricardo J. Noriega

Temporal Asymmetry as Precondition of Experience. The Foundation of the Arrow of Time 37
Th. Görnitz, E. Ruhnau, and C. F. v. Weizsäcker

String Model in Differential Forms 47
S. N. Solodukhin

Electroweak Interactions at an Infinite Sublayer Quark Level. II 59
Y. Okamoto, K. Sugita, and M. Sekine

Cherenkov Radiation Spectrum 61
L. Fülöp and T. Biró

Fully Nonlinear Ion-Acoustic Solitary Waves in a Magnetized Plasma 75
Kamal Kumar Ghosh, Depankar Ray, and S. N. Paul

Raman Scattering in Impurity-Induced Anharmonic Crystals 81
C. P. Painuli, B. P. Bahuguna, B. D. Indu, and M. D. Tiwari

Higgs Field and a New Scalar–Tensor Theory of Gravity 109
H. Dehnen, H. Frommert, and F. Ghaboussi

Dirac's Conjecture about Constraints 115
Qi Zhi

Relativistic Internal Time Operator 119
Ioannis E. Antoniou and Baydyanath Misra

Spontaneous Symmetry Breaking in Static Robertson–Walker Space-Time with Background Charge 137
Bimal Kumar Majumdar and Rajkumar Roychoudhury

Cosmological Mesonic Viscous Fluid Model 151
G. Mohanty and B. D. Pradhan

Double Bäcklund Transformations and Fission Solutions of Axisymmetric Gravitational Equations 161
Wu Ya-Bo

International Journal of Theoretical Physics

Volume 31, Number 2 **February 1992**

CONTENTS

Gauge Mechanical Model in N Dimensions 171
A. Bouzas

An Alternative to Wave Mechanics on Curved Spaces 187
Roman Tomaschitz

Binary Logic is Rich Enough 211
Roman R. Zapatrin

Forced Periodic Oscillations and the Jones Polynomial 221
Giuseppe Gaeta

Anomalous e^+e^- Pairs in Heavy Ion Collisions and Solar Neutrinos 229
Matti Pitkänen and Petri Mähönen

Topological Geometrodynamics and the Solar Neutrino Problem 245
Matti Pitkänen and Petri Mähönen

Hamiltonian Structure of Gravitational Field Theory 269
Jerzy Rayski

Einstein Algebras and General Relativity 277
Michael Heller

Solutions of the Wheeler-DeWitt Equation 289
Subenoy Chakraborty

Bianchi I Cosmological Model and the No-Boundary Condition 303
Subenoy Chakraborty

Cosmological ϕ^4, ϕ^6, and Sine-Gordon Theories with Broken Symmetry 313
Huang Baofa and Wang Jingchang

Inhomogeneous Static Model in Brans-Dicke Theory 321
Marcelo Samuel Berman

Inflation in Brans-Dicke Theory for the Radiation Universe 325
Marcelo Samuel Berman and M. M. Som

Raychaudhuri's Equation and the Present Universe in Brans-Dicke Theory 329
Marcelo Samuel Berman

The Problem of Irreversibility in Newtonian Dynamics 333
Michail Zak

Ion Acoustic Solitons in a Streaming Relativistic Plasma with Negative Ions 343
Sudeshna Chakravorty, A. Roy Chowdhury, and S. N. Paul

Dichotomies for Linear Impulsive Differential Equations with Variable Structure 353
N. V. Milev and D. D. Bainov

Uniform Stability with Respect to the Impulsive Perturbations of the Solutions of Impulsive Differential Equations 363
A. B. Dishliev and D. D. Bainov

International Journal of Theoretical Physics

Volume 31, Number 3 March 1992

CONTENTS

Bibliography on Quantum Logics and Related Structures 373
M. Pavičić

Amplitudes on Entities 463
Stanley Gudder

Three-Particle Einstein-Podolsky-Rosen Correlations 515
K. Wódkiewicz

Electroweak Interactions at an Infinite Sublayer Quark Level. III. *CP* Violation 521
K. Sugita, Y. Okamoto, and M. Sekine

Physical Complexity and Zipf's Law 525
R. Günther, B. Schapiro, and P. Wagner

Static Anisotropic Fluid Spheres in General Relativity with Non-uniform Density 545
T. Singh, G. P. Singh, and R. S. Srivastava

Bianchi Type II, VIII, and IX Cosmological Models in Lyra's Geometry 553
T. Singh and Anil K. Agrawal

Differential Geometry of Spacetime Tangent Bundle 575
Howard E. Brandt

International Journal of Theoretical Physics

Volume 31, Number 4 **April 1992**

CONTENTS

Perturbation Theory with Higher Derivative Couplings 581
Josip Šoln

The Nonsymmetric Kaluza-Klein (Jordan-Thiry) Theory in the Electromagnetic Case 611
M. W. Kalinowski

Memory Systems, Computation, and the Second Law of Thermodynamics 743
David H. Wolpert

International Journal of Theoretical Physics

Volume 31, Number 5 **May 1992**

SPECIAL ISSUE: Quantum Structures 1
GUEST EDITOR: G. Kalmbach

CONTENTS

Introduction 787

Filters and Supports in Orthoalgebras 789
D. J. Foulis, R. J. Greechie, and G. T. Rüttimann

Semantic Incompleteness of Quantum Physics 809
Claudio Garola

Systems of Covariance in Quantum Probability 825
Stanley Gudder

Structure of the Set of Annihilators 835
Karsten Keller

Concrete Quantum Logics with Covering Properties 843
Vladimír Müller, Pavel Pták, and Josef Tkadlec

Boolean Transfer from Coherent Quantum Logics to Quantum Logics with Continuous Superselection Rules 855
Hirokazu Nishimura

Orthostructures from Sesquilinear Forms. A Primer 871
Robert Piziak

Modular Almost Orthogonal Quantum Logics 881
Sylvia Pulmannová and Zdenka Riečanová

Regular Measures and Inner Product Spaces 889
Anatolij Dvurečenskij

International Journal of Theoretical Physics

Volume 31, Number 6 **June 1992**

CONTENTS

$SU(2)_q$ in a Hilbert Space of Analytic Functions 907
Simón Codriansky

Independence of Automorphism Group, Center, and State Space of Quantum Logics 925
Mirko Navara

Three-Point Phase, Symplectic Measure, and Berry Phase 937
V. Cantoni and L. Mistrangioli

New Nondestructive Tests, from Frames 945
Elihu Lubkin

Quaternionic Quantum Mechanics is Consistent with Complex Quantum Mechanics 965
C. G. Nash and G. C. Joshi

Structural Organization of an RNA Catalyst with the Random Energy Model As a Reference Frame 983
Ariel Fernández

Multiphase Percolation and Josephson Model for High-Temperature Superconductivity 995
El-Sayed M. El-Horbaty and E. Ahmed

e^-e^+ Production by a Nambu String 1003
E. B. Manoukian

Phenomenological Description of Particle and Entropy Creation 1007
U. Kasper

Commutative Asymptotic Limit of a Quasi-$SU(2)$ Formulation of General Relativity 1015
Anne Magnon

Finsler Gauge Transformations and General Relativity 1025
R. G. Beil

199 Causal Classes of Space-Time Frames 1045
Bartolomé Coll and Juan Antonio Morales

The Ultimate Speed Implied by Theories of Weber's Type 1063
A. K. T. Assis and R. A. Clemente

Gauge and Bäcklund Transformations for the Generalized Sine-Gordon Equation and Its η-Dependent Modified Equation 1075
Yu-kun Zheng and W. L. Chan

International Journal of Theoretical Physics

Volume 31, Number 7 July 1992

CONTENTS

Topology Lattice As Quantum Logic 1093
A. A. Grib and R. R. Zapatrin

Axioms for Quantum Theory 1103
Gerhard Gerlich

Logic of Likelihood 1131
Michael J. W. Hall

Deducing the Schrödinger Equation from Minimum χ^2 1153
Silviu Guiasu

Classical Analog of Quantum Phase 1177
G. N. Ord

SS433 and Hydrogen Spectrum Beyond the Paschen–Back Region 1197
Jeffrey M. Cohen and Boris Kuharetz

Equivalent Local Potentials for a Coupled-Channel System and the Feshbach Optical Potential 1203
C. Daskaloyannis

Generalized Large Number Hypothesis and Cosmological Constant 1217
Marcelo Samuel Berman

Torsion, Superconductivity, and Massive Electrodynamics 1221
L. C. Garcia de Andrade

Nonstandard Model of the Expanding Universe 1229
M. Mattes and M. Sorg

Polynomial Solutions for Coupled $U(1)$-Gauge Einstein Equations 1243
E. Stédile and Sandra R. Oliveira

Minimal Coupling of Electromagnetic Field in Riemann–Cartan Spacetime for Perfect Fluids 1253
Larry L. Smalley and Jean P. Krisch

Variational Principle for the $P(4)$ Affine Theory of Gravitation and Electromagnetism 1267
J. H. Chilton and L. K. Norris

Field Equations for Gravity Quadratic in the Curvature 1283
Bernhard Rose

Magnetic Field Generation from Alfven Waves Propagating along Helical Lines of Force 1295
B. Bera, Chandra Das, B. Chakraborty, Monoranjan Khan, V. Krishan, and B. Bhattacharyya

Higher-Order Mechanical Systems with Constraints 1303
Manuel de León and Paulo R. Rodrigues

Dual Geometric-Gauge Field Aspects of Gravity 1315
Huei Peng and K. Wang

Exponential Stability of Linear Impulsive Differential Equations 1325
N. V. Milev and D. D. Bainov

Dissipative Formation of Hole-Like Excitation in Ion-Acoustic Plasma 1335
A. Roy Chowdhury and Gobinda Pakira

International Journal of Theoretical Physics

Volume 31, Number 8 **August 1992**

CONTENTS

Characterization of Chaos 1345
Daniel M. Heffernan, P. Jenkins, M. Daly, B. J. Hawdon, and J. O'Gorman

Irreversible Evolution in Quantum Logics 1363
Antonio Zecca

Unified Treatment of Fermions and Bosons 1371
Dieter W. Ebner and Suemi Rodriguez-Romo

Low-Energy Consequences of High-Energy Quantum Chaos 1375
F. Winterberg

$O(N)$ Symmetric Finite-Temperature φ^4 Theory in $2+1$ Dimensions 1389
Bimal Kumar Majumdar and Rajkumar Roychoudhury

Relativistically Corrected Masses of Ground-State Baryons in Hyperspherical Harmonic Quark Model 1407
Andrea Raspini

Cosmic Inflation and Cosmic String 1417
Li Yuanjie

Equivalence in Two-, Three-, and Four-Dimensional Space-Times 1421
Ø. Grøn and E. Eriksen

Bianchi Type III and Kantowski–Sachs Cosmological Models in Lyra Geometry 1433
T. Singh and G. P. Singh

Large Number Hypothesis 1447
Marcelo Samuel Berman

What If $\Omega \neq 2q$? 1451
Marcelo Samuel Berman

Thermodynamics of Rare Events 1455
B. H. Lavenda and A. Florio

The Multimomentum Hamiltonian Fermalism in Gauge Theory 1477
G. Sardanashvily and O. Zakharov

Nonlinear Rayleigh–Taylor Instability in Magnetic Fluids Between Two Parallel Plates 1505
Abdel Raouf F. Elhefnawy

Necessary and Sufficient Conditions for Existence of Exponential Dichotomy of Impulsive Equations 1521
D. D. Bainov, S. I. Kostadinov, and P. P. Zabreiko

Parametrically Driven Pendulum and Exact Solutions 1527
W.-H. Steeb and N. Euler

Response of Self-Excited Three-Degree-of-Freedom Systems to Multifrequency Excitations 1531
A. M. Elnagar and A. F. El-Bassiouny

Solution Spectrum of Nonlinear Diffusion Equations 1549
W. Ulmer

International Journal of Theoretical Physics

Volume 31, Number 9 September 1992

SPECIAL ISSUE: Quantum Logics, Part I
GUEST EDITORS: Jarosław Pykacz and Mladen Pavičić

CONTENTS

Title Page 1569

Preface 1571

Brouwer–Zadeh (Fuzzy-Intuitionistic) Posets for Unsharp Quantum Mechanics 1573
Gianpiero Cattaneo

Compositions of Sasaki Projections 1599
Georges Chevalier and Sylvia Pulmannovà

The Subject Matter of Quantum Mechanics 1615
Michael Drieschner

Higher-Order Quantum Logics 1627
David Finkelstein

Quantum Logics Seen As Quantum Testability Theories 1639
Claudio Garola

Semantic Alternatives in Brouwer–Zadeh Logics 1653
Roberto Giuntini

Macroscopic Realizations of Quantum Logics 1669
A. A. Grib and R. R. Zapatrin

Completeness in Sums of Boolean Algebras and Logics 1689
Vladimír Janiš and Zdenka Riečanová

Quantum Theory As a Theory in a Classical Propositional Calculus 1699
Othman Qasim Malhas

Quantum Probabilities, Operators of State Preparation, and the Principle of Superposition 1715
Mioara Mugur-Schachter

A New Axiomatization of Unified Quantum Logic 1753
M. Pavičić

Fuzzy Set Ideas in Quantum Logics 1767
Jarosław Pykacz

On the Representation of Quantum Mechanics on Phase Space 1785
Werner Stulpe

Quantum Logic and Physics 1797
George Svetlichny

Spacetime Structure on Quantum Lattice 1803
László E. Szabó

International Journal of Theoretical Physics

Volume 31, Number 10 **October 1992**

SPECIAL ISSUE: Quantum Logics, Part II
GUEST EDITORS: Jarosław Pykacz and Mladen Pavičić

CONTENTS

Title Page 1811

Preface 1813

Construction of Reality and Its Influence on the Understanding of Quantum Structures 1815
Diederik Aerts

Mechanistic Classical Laboratory Situation with a Quantum Logic Structure 1839
Diederik Aerts and Bruno Van Bogaert

Problem of Classical and Nonclassical Probabilities 1849
Enrico G. Beltrametti and Maciej J. Mączyński

Quantum Logical Solution to the Measurement Problem of Quantum Mechanics 1857
Jeffrey Bub

Physical Content of Preparation-Question Structures and Brouwer-Zadeh Lattices 1873
Gianpiero Cattaneo and Giuseppe Nisticò

Quantum Logics and Completeness Criteria of Inner Product Spaces 1899
Anatolij Dvurečenskij

Problem of Hidden Variables 1909
Emilio Santos

International Journal of Theoretical Physics

Volume 31, Number 11 **November 1992**

CONTENTS

Tensor Products in Generalized Measure Theory 1915
Alexander Wilce

Quantum Field Theory of Binary Alternatives 1929
Th. Görnitz, D. Graudenz, and C. F. v. Weizsäcker

Time-Dependent Variational Method for Sine-Gordon Quantum Field Theory 1961
Anjana Sinha and Rajkumar Roychoudhury

Schrödinger and Dirac Quantum Random Walks 1973
Stanley Gudder

Experimental Restrictions on Spin–Spin Interactions in Gauge Gravity 1993
Yu. N. Obukhov and I. V. Yakushin

Lipschitzian Quantum Stochastic Differential Inclusions 2003
G. O. S. Ekhaguere

Avoiding Higgs Fields 2029
F. Ghaboussi

Parity Nonconservation in Electromagnetic Systems 2035
E. Comay

Electroweak Interactions at an Infinitive Sublayer Quark Level. IV. Composite Model of Electron, Neutrino, and Gauge Bosons 2043
Y. Okamoto, K. Sugita, and M. Sekine

International Journal of Theoretical Physics

Volume 31, Number 12 **December 1992**

CONTENTS

Important Announcement

Hawking Radiation of Dirac Particles in Kasner-Type Spacetime 2047
Mainuddin Ahmed and Asit Kumar Mondal

Inhomogeneous R^2 Inflationary Models 2053
Li Yuanjie and Wang Zhijun

Self-Dual Yang–Mills Fields in an Einstein Universe 2061
Alexander Pavlov

Experimental Facts and Gravitational Energy in General Relativity 2065
Noah Nissani and Elhanan Leibowitz

Cosmological Model with Heat Flow 2087
Ashfaque H. Bokhari

Ricci Tensor with Six Collineations 2091
Ashfaque H. Bokhari

Anisotropic Cosmological Models of Bianchi Types III and V in Lyra's Geometry 2095
Shri Ram and Prem Singh

Cosmological Compactification in Kaluza–Klein Model and Time-Dependent Cosmological Term 2103
S. K. Srivastava

Solving Bertolami's Equations for Brans–Dicke Cosmological Models 2115
Zoran Pazameta

Ideal and Resistive Magnetohydrodynamics Modes 2121
Bhimsen K. Shivamoggi